Subquery

Tuesday, 27 January 2026 12:39 PM

1. What is a Subquery?

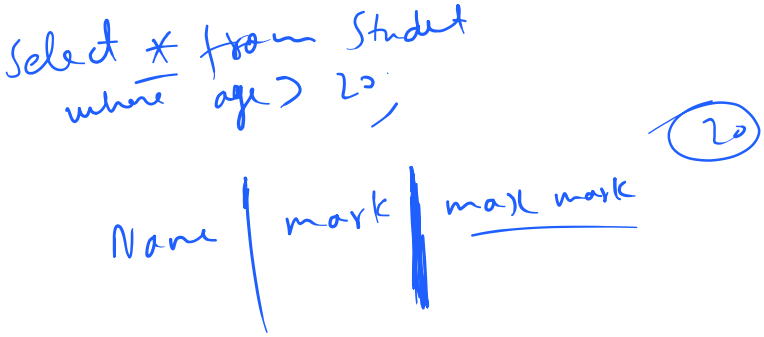
A **subquery** is a SQL query written **inside another SQL query**.
It is also known as a **nested query** or **inner query**.

- The **inner query** executes first
- The **outer query** uses the result of the inner query

Basic Syntax

```
SELECT column_name
FROM table_name
WHERE column_name = (SELECT column_name FROM table_name);
```

📌 Parentheses () are **mandatory** for subqueries.



2. Why Do We Use Subqueries?

Subqueries are used when:

- A query depends on the result of another query
- The value is **dynamic**, not fixed
- Step-by-step logic is required
- Aggregated values (AVG, MAX, MIN) are involved

Example requirement:

Find students scoring more than **average marks**

You cannot hardcode average → you calculate it using a subquery.

3. Single-Row Subquery

Concept

A **single-row subquery** returns **exactly one value** (one row, one column).

✓ Used with:

- =
- >
- <
- >=
- <=

Example

```
SELECT name, marks
FROM students
WHERE marks > (
  SELECT AVG(marks)
  FROM students
);
```

📌 Subquery returns one value (average marks)
📌 Outer query compares each row with that value

Practice Question

👉 **Find students whose age is greater than the average age of all students.**

4. Multiple-Row Subquery (IN)

Concept

A **multiple-row subquery** returns **more than one row**.

✓ Used with IN operator
✓ Checks membership in a list

Example

```
SELECT name
FROM students
WHERE department IN (
  SELECT department
  FROM students
  WHERE city = 'Delhi'
);
```

📌 Subquery returns multiple departments
📌 Outer query selects students from those departments

Practice Question

👉 **Display students who belong to departments that have at least one student from Mumbai.**

5. Multiple-Row Subquery (ANY)

Concept

ANY compares a value with **any one value** returned by the subquery.

✓ Condition is TRUE if **at least one comparison succeeds**

Example

```
SELECT name, marks
```

```
SELECT name, marks
FROM students
WHERE marks > ANY (
  SELECT marks
  FROM students
  WHERE department = 'CSE'
);
```

📌 Marks must be greater than **at least one CSE student**

Practice Question

👉 **Find students whose marks are greater than ANY student from the ECE department.**

6. Multiple-Row Subquery (ALL)

Concept

ALL compares a value with **every value** returned by the subquery.

✓ Condition is TRUE only if **all comparisons succeed**

Example

find students whose marks are greater than all student from cities having average marks below 60

```
SELECT name, marks
FROM students
WHERE marks > ALL (
  SELECT marks
  FROM students
  WHERE department = 'ME'
);
```

📌 Marks must be greater than **every ME student**

Practice Question

👉 **Find students who scored more than ALL students from the Civil department.**

7. Subquery in WHERE Clause

Concept

Used when filtering rows based on the result of another query.

✓ Most common use of subqueries

Example

```
SELECT *
FROM students
WHERE city = (
  SELECT city
  FROM students
  WHERE name = 'Amit'
);
```

📌 Subquery finds Amit's city

📌 Outer query finds students from the same city

Practice Question

👉 **Find students who are in the same year_of_study as the student having the highest marks.**

8. Subquery in SELECT Clause (Scalar Subquery)

Concept

A **scalar subquery**:

- Returns exactly **one value**
- Appears in the SELECT clause
- Executes once

Example

```
SELECT name,
    marks,
    (SELECT MAX(marks) FROM students) AS highest_marks
FROM students;
```

📌 Same value is shown for every row

Practice Question

👉 **Display each student's name along with the overall average marks.**

9. Subquery in FROM Clause (Derived Table)

Concept

A subquery in FROM clause behaves like a **temporary table**.

✓ Must be given an alias

✓ Often used with GROUP BY

Example

```
SELECT department, avg_marks
FROM (
  SELECT department, AVG(marks) AS avg_marks
  FROM students
  GROUP BY department
) AS dept_avg
WHERE avg_marks > 75;
```

📌 Inner query creates derived table